

WHAT IS CLAIMED IS:

1. A material testing method comprising the steps of:

attaching a weight to an object to be measured to  
5 form a mass-spring system in which the object to be  
measured serves as a spring element;

applying vibration to the mass-spring system;

measuring an inertial force acting on the weight  
and an displacement of the weight; and

10 evaluating mechanical properties of the object to  
be measured based on the inertial force and displacement.

2. The method according to claim 1, wherein a  
light wave interferometer, which launches measurement light  
at a reflecting part provided on the weight and measures  
15 the state of the reflected light from the reflecting part,  
is used to determine the displacement and acceleration of  
the weight from the state of the reflected light measured,  
and the inertial force of the weight is calculated from the  
acceleration of the weight determined.

20 3. The method according to claim 1, wherein the  
weight is supported by a pneumatic linear bearing.

4. The method according to claim 2, wherein the  
weight is supported by a pneumatic linear bearing.

25 5. The method according to any one of claims 1 to  
4 wherein an actuator is coupled to the object to be  
measured, and vibration is applied to the mass-spring  
system by the actuator.